REMARKS

The following remarks are in response to the Office Action dated June 15, 2006. Claims 1-7, and 9-36 are now present in this case. Claims 27-36 are allowed. Claims 1-7, 9-12, 15-17, and 25 are amended. Claim 8 is canceled.

The applicants wish to express their appreciation to the Examiner for the telephone interview with the applicants' attorney on August 29, 2006. Several claims are amended in response to that interview. No new matter is introduced.

The applicants further wish to express their appreciation to the Examiner for the allowance of claims 27-36 and for the further indication that claims 15-21 would be allowable if rewritten in independent form. The applicants have placed claim 15 in independent form. Accordingly, claim 15 and dependent claims 16-17 are now in condition for allowance.

Claims 1-4, 8, and 26 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,338,368 to Dotts et al. The applicants respectfully traverse this rejection and request reconsideration. In the Office Action, Dotts et al. is broadly interpreted such that the metal skin of the space shuttle is considered to be a "thermal protection system" while the ceramic tiles mounted on the exterior of the shuttle are interpreted to be "experimental packages." The applicants believe this to be an overly broad interpretation of Dotts et al. A "thermal protection system" is known by those skilled in the art as the outermost layer on the spacecraft that protects the spacecraft from the high temperatures associated with re-entry. Nonetheless, the applicants have amended claim 1 to more clearly characterize the claimed invention. Specifically, claim 1 recites *inter alia* a reusable orbital vehicle having an outer skin and "a thermal protection system attached to the outer skin of the orbital vehicle to thereby form an outermost layer of the orbital vehicle, the thermal protection system being formed by materials capable of withstanding environmental temperatures associated with re-entry of the orbital vehicle to thereby maintain operational viability of the orbital vehicle during re-entry." Thus, the outermost layer of the orbital vehicle is formed by a thermal protection system that protects the spacecraft from the high temperatures associated with re-entry.

It should be noted that the intermediate elements of the thermal mounting system disclosed in Dotts et al. are incapable of withstanding the high temperatures

associated with re-entry. For example, the metal hull 12, the strain isolation pad 14, and silicone bond layers 16-18 in Dotts et al. are incapable of withstanding the high temperatures associated with re-entry. Accordingly, these intermediate layers are not the thermal protection system as recited in claim 1. The tile 10 in Dotts et al. is the thermal protection system and forms the outermost layer of the space shuttle.

Claim 1 also recites "an internal payload coupled to an interior portion of the orbital vehicle." Dotts et al. is directed solely to a technique for making and attaching TPS tiles and does not teach or suggest any orbital vehicle interior or an internal payload. Claim 1 further recites "a first external payload package affixed to the orbital vehicle at a first attachment position on the outermost layer of the orbital vehicle ... wherein the first attachment position is located such that destruction of the first external payload package will not affect the operational viability of the orbital vehicle."

The thermal tiles in Dotts et al. form the outermost layer of the space shuttle and provide the thermal protection required to withstand the environmental temperatures associated with re-entry of the shuttle. Dotts et al. does not teach or suggest mounting any external payload positioned on the outermost layer of the orbital vehicle, as recited in claim 1. Furthermore, the silica tiles in Dotts et al. are part of the spacecraft itself and are not considered part of the payload. A "payload" is defined as "the revenue-producing part of a cargo" or, in aerospace, "the passengers, crew, instruments, or equipment carried by an aircraft, spacecraft, or rocket." "*Webster's II New College Dictionary,* © 2001, Houghton Mifflin Company. The silica tiles in Dotts et al. form part of the spacecraft itself and are not part of the payload. The silica tiles recited in Dotts et al. are an essential part of the vehicle and allow the vehicle to survive the high temperatures associated with re-entry.

In contrast, the first external payload package recited in claim 1 is a payload that is not required for operational viability of the orbital vehicle. It is part of a payload and is positioned in a location such that "destruction of the first external payload package will not affect the operational viability of the orbital vehicle." Dotts et al. does not teach or suggest any external payload package. Accordingly, claim 1 is clearly allowable over Dotts et al. Dependent claims 2-4 and 26 are also allowable in view of the fact that they depend from claim 1, and further in view of the recitation in each of those claims.

Claims 1-4, 8, and 12-14 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,402,965 to Cervisi et al. The applicants respectfully traverse this rejection and request reconsideration. Although the Office Action provides no details as to an interpretation of Cervisi et al., it appears that the broad interpretation is that the orbital vehicle body is defined as the "thermal protection system" while the high thermal performance (HTP) tiles 110 are considered to be experiment packages. Such an interpretation is inconsistent with Cervisi et al. which defines the HTP tiles "as part of the thermal protection system." (See column 7, lines 16-17.) Further details of the thermal protection system are described in Cervisi et al. at column 6, lines 25-65. As stated in Cervisi et al., "The space shuttle uses TPS with an aluminum structure. The present invention, on the other hand, couples the use of TPS with a graphite composite structure." (See column 6, lines 54-56.) Thus, the thermal protection system described by Cervisi et al. describes the TPS with the space shuttle as the thermal protection system over the aluminum structure of the space shuttle while the thermal protection system of Cervisi et al. is over a graphite composite structure. In either case, Cervisi et al. clearly teaches that the tiles are part of the thermal protection system as it is known to those skilled in the art and as the term is used in the pending application.

Claim 1 clarifies the thermal protection system as "attached to the outer skin of the orbital vehicle to thereby form an outermost layer of the orbital vehicle, the thermal protection system being formed by materials capable of withstanding environmental temperatures associated with re-entry of the orbital vehicle to thereby maintain operational viability of the orbital vehicle during re-entry." Neither the aluminum structure of the shuttle nor the graphite composite structure in Cervisi et al. are capable of withstanding such high temperatures. Clearly, the thermal protection system described in Cervisi et al. includes the thermal blankets or HTP tiles to provide the necessary thermal protection. However, Cervisi et al. does not teach or suggest "a first external payload package affixed to the orbital vehicle at a first attachment position on the outermost layer of the orbital vehicle ... wherein the first attachment position is located such that destruction of the first external payload package will not affect the operational viability of the orbital vehicle," as further recited in claim 1. Cervisi et al. does not teach or suggest any external payloads mounted on the outermost layer of the orbital vehicle.

Furthermore, the thermal protection system disclosed in Cervisi et al. is not a payload since it does not fit the definition of payload described above. In addition, the destruction of the thermal protection system in Cervisi et al. dooms the spacecraft. Cervisi et al. does not teach external payloads mounted at a position such that the destruction of the first external payload package will not affect the operational viability of the orbital vehicle, as recited in claim 1. For these reasons, claim 1 is clearly allowable over Cervisi et al. Claims 2-4, and 12-14 are also allowable in view of the fact that they depend from claim 1, and further in view of the recitation in each of those claims.

Claims 1, 5-7, 9-11, and 22-25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Statutory Invention Registration No. H1133 to Bridges et al. combined with Dotts et al. The applicants respectfully traverse this rejection and request reconsideration. Bridges et al. is directed to an arresting system and method for aircraft, namely the space shuttle. The Office Action cites the landing gear recess covers on the underside of the space shuttle as access panels but notes that Bridges et al. is silent on experimental packages. The Office Action cites Dotts et al. as teaching experimental packages and attachment positions. The inapplicability of Dotts et al. has already been discussed above. Namely, the outermost layer of the space shuttle in Dotts et al. is the thermal protection system formed on the outer body of the space shuttle. As recited in claim 1, the thermal protection system is attached to the outer skin of the orbital vehicle to form an outermost layer of the orbital vehicle. The thermal protection system is "formed by materials capable of withstanding environmental temperatures associated with the re-entry of the orbital vehicle to thereby maintain operational viability of the orbital vehicle during re-entry." Thus, any thermal protection system inherently disclosed by Bridges et al. correspond to the thermal tiles and thermal protection system disclosed in Dotts et al. This includes thermal tiles mounted on the recess covers for the landing gear.

The combination of Bridges et al. and Dotts et al. does not suggest "a first external payload package affixed to the orbital vehicle at a first attachment position on the outermost layer of the orbital vehicle," as recited in claim 1. As discussed in detail above, the outermost layer of the orbital vehicle in Dotts et al. and Bridges et al. are the thermal protection system that provide protection against the environmental temperatures associated with re-entry. Nothing in the combination of Bridges et al. and

Dotts et al. suggest mounting external payload packages on the outermost layer of the orbital vehicle. Furthermore, neither Dotts et al. nor Bridges et al., taken alone or in combination, suggest a system where "the first attachment position is located such that destruction of the first external payload package will not affect the operational viability of the orbital vehicle." As bitter experience demonstrates, the loss of the thermal protection system on the shuttle leads to catastrophic failure of the orbital vehicle during re-entry. For these reasons, claim 1 is clearly allowable over the combination of Bridges et al. and Dotts et al. Claims 5-7, 9-11, and 22-25 are also allowable in view of the fact that they depend from claim 1, and further in view of the recitation in each of those claims.

In view of the above remarks, reconsideration of the subject application and its allowance are kindly requested. The applicants have made a good faith effort to place all claims in condition for allowance. If questions remain regarding the present application, the Examiner is invited to contact the undersigned at (206) 628-7640.

Respectfully submitted,
George E. Mueller et al.
Davis Wright Tremaine LLP

/Michael J. Donohue, Reg. #35859/

Michael J. Donohue

MJD:gatc

1501 Fourth Avenue
Suite 2600
Seattle, Washington 98101-1688
Phone: (206) 622-3150
Fax: (206) 628-7699

1826298_1.DOC